

# **GAMES: Virtual Worlds and Reality**

Selected Papers of ISAGA 2008

Eugenijus Bagdonas & Irena Patasiene (eds.)

## ***Editorial Board***

**Prof. Eugenijus Bagdonas**, Kaunas University of Technology – Editor-in-Chief  
**Associated professor dr. Irena Patasiene**, Kaunas University of Technology – Editor-in-Chief

### ***39th ISAGA Conference Scientific committee***

Prof. Dr. Arata Ichicava Ryutsu Keizai university, Japan  
Dr. Elysebeth Leigh The University of Technology, Sydney, Australia  
Prof. Dr. Jan H. G. Klabbers KMPC, The Netherlands  
Dr. Jeremy J. S. B. Hall Churchill Fellow, Managing Partner, Hall Marketing, UK  
Prof. Dr. Raimundas Jasinevicius Kaunas University of Technology, Lithuania  
Assoc. Prof. Dr. YY Cai Nanyang Technological University, Singapore  
Prof. Dr. Richard D. Teach Georgia Institute of Technology, US  
Assoc. Prof. Dr. Maria Angeles Andreu Universidad Politecnica of Valencia, Spain  
Prof. Dr. Beverly Rising Universidad Pontificia Comillas de Madrid, Spain  
Assoc. Prof. Dr. Igor Mayer Delft University of Technology, The Netherlands.  
Dr. Pieter. van der Hijden Sofos Consultancy, The Netherlands  
Dr. Amparo Garcia-Carbonell Universidad Polit'ecnica de Valencia, Spain  
Prof. Dr. Willy C. Kriz University of Applied Sciences, Austria  
Prof. Dr. Dmitry Kavtaradze Moscow state University, Russian Federation  
Prof. Dr. Shigehisa Tsuchiya Chiba Institute of Technology, Japan  
Assoc. Prof. Dr. YEO Gee Kin National University of Singapore, Singapore  
Anne Villems, Tartu University, Estonia  
Prof. Dr. Viktorija Barsauskiene Kaunas University of Technology, Lithuania  
Assoc. Prof. Dr. Raimonda Minkute Kaunas University of Technology, Lithuania  
Assoc. Prof. Dr. Danguole Rutkauskiene Kaunas University of Technology, Lithuania  
Prof. Dr. Eugenijus Bagdonas Kaunas University of Technology, Lithuania  
Assoc. Prof. Dr. Irena Patasiene Kaunas University of Technology, Lithuania

#### ***Editorial Board address:***

The Editorial Board of "ISAGA 2008 Selected Papers"  
K. Donelaičio str. 20-101,  
LT-44239 Kaunas, Lithuania  
Telephone +370 37 300118; fax.: +370 37 300102  
e-mail: [rpk@ktu.lt](mailto:rpk@ktu.lt), [irena.patasiene@ktu.lt](mailto:irena.patasiene@ktu.lt)

Cover design: Laimute Varkalaite

© 2009 Eugenijus Bagdonas & Irena Patasiene (eds.) Kaunas University of Technology. All rights reserved. No part of this publication may be reproduced, stored in the retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission in writing from the proprietor.

ISBN 978-9955-25-682-3

# CONTENTS

EUGENIJUS BAGDONAS, IRENA PATASIENE	
<i>Preface</i> .....	i
JAN H.G. KLABBERS	
<i>Virtual worlds and reality: knowing through imitation</i> .....	1
ELYSSEBETH LEIGH	
<i>Exploring questions for facilitators of learning in simulations</i> .....	11
ELIZABETH J TIPTON MURFF	
<i>Unexpected multicultural experiential learning</i> .....	19
MIKA IGARASHI	
<i>Developing a Research Methodology for the Quantitative Analysis of In-Game Social Behavior</i> .....	23
MIKA IGARASHI, YOSUKE NAGASHIMA, AKIRA BABA	
<i>Are Tendencies in Real-World Social Behavior Reproduced in the Virtual World? – Investigation and Implications</i> .....	27
GINTA RAILIENĖ, RIMANTĖ HOPENIENĖ	
<i>The Assessment of Key Pedagogical Objectives using ProfitPlanner Board Game in Diversified Environment</i>	31
GERT JAN HOFSTEDE, TIM VERWAART, CATHOLIJN M JONKER	
<i>Lemon car game</i> .....	39
KLAUS-PETER SCHULZ, RALPH RIEDEL, MICHAEL FOX	
<i>Playing and Reflecting the Firm</i> .....	47
JYLDYZ TABYLDY KYZY, BRIDE MALLON, DAVID NEWMAN, PHILIP DAWID	
<i>“World of Uncertainty”: A Computer Game for Decision Makers</i> .....	53
ELI LINDBLAD REM	
<i>How can the multi-focused methodology applied to role plays improve educational learning / professional knowledge in higher education?</i> .....	57
WILLY C. KRIZ, EBERHARD AUCHTER, HELMUT WITTENZELLNER	
<i>Evaluation of Simulation Games in the German entrepreneurship education program “exist-priME-cup” ....</i>	63
ELLEN HIJMANS, VINCENT PETERS, MARLEEN VAN DE WESTELAKEN, JEANNETTE HELDENS, ANGELINE VAN GILS	
<i>Encounters of a safe environment in simulation games</i> .....	71
RICHARD TEACH, ELIZABETH JT MURFF	
<i>Confounded learning in business simulations</i> .....	83
JUOZAS PATASIUS, IRENA PATASIENE, MARTYNAS PATASIUS	
<i>Simulation of economic factors in public sector</i> .....	89
GRAZVYDAS ZAUKAS	
<i>Simulation of bank operations using “Powersim Studio”</i> .....	95
HARALD WARMELINK, GEERTJE BEKEBREDE, CASPER HARTEVELD, IGOR MAYER	
<i>Understanding Virtual Worlds: An Infrastructural Perspective</i> .....	99
SHINNOSUKE KAWAKAMI	
<i>Science Rooms : Developing a New Digital Game to Learn Science</i> .....	105

EVA KEERIS	
<i>Combining concepts from Modeling and Simulation and Game research: Realistic Virtual Environments ...</i>	109
M <sup>a</sup> ÁNGELES ANDREU-ANDRÉS, MIGUEL GARCÍA-CASAS	
<i>A Problem-Based Task becoming a Simulation .....</i>	115
ELENA V. ZARUKINA	
<i>Simulation and gaming methods in educational process at a higher school: enhancing students' scientific research activity .....</i>	121
ARATA ICHIKAWA	
<i>A Game: real and virtual worlds .....</i>	125
ADRIAN MALLON	
<i>Pleasure, Responsibility and the Ideated Author in Virtual-World Gaming .....</i>	129
MASAMI IDO, SHINTARO HAYASHI, MASAKO SASAKI, YOSHIO HAYASHI	
<i>University Education Reform by Employing Gaming-Simulation: A Case Study at Akita University in Japan .....</i>	137
MAAIKE DE JONG	
<i>The World, Your Playground; students at play in reconstructing reality .....</i>	143
ELENA LIHACHEVA, DMITRY KAVTARADZE	
<i>What is Uncertainty in Games and Simulations .....</i>	153
MIKHAIL KRYUKOV, ELENA LIKACHEVA, ANDRII MIROSHNYCHENKO, DMITRY KAVTARADZE	
<i>Defining Strategy in Natural Resource Management on Simulation Game CoMPAS .....</i>	157
YEO GEE KIN, BIMLESH WADHWA, VU TRUONG VINH, NGUYEN PHUC KHANH LUAN, TRAN QUOC TUAN	
<i>In-process Assessments in Serious Games .....</i>	165
JUSSI HOLOPAINEN, STAFFAN BJÖRK	
<i>Gameplay Design Patterns for Motivation .....</i>	169
JEANNE TOLORDAVA	
<i>Business Games and Modern Training Technologies in University Education .....</i>	173
BEGOÑA MONTERO FLETA, BEVERLY RISING, CARMEN PÉREZ-SABATER	
<i>New Insights into Group Work Assessment .....</i>	179
EUGENIJUS BAGDONAS, IRENA PATASIENE, VALENTINA DAGIENE, VYTAUTAS SKVERNYS, MARTYNAS PATASIUS	
<i>Web-based Business Game for multidisciplinary teaching .....</i>	189
JOAN K. TEACH	
<i>TEACHING TEACHERS TO TEACH: A Game-Frame approach .....</i>	195
CASPER HARTEVELD, HARALD WARMELINK, MICHELE FUMAROLA, IGOR MAYER	
<i>Bringing Concepts Alive in Second Life: A Design Based Experiment .....</i>	199
LIN ZHIYUAN, CHOW NAM CHI, YEO GEE KIN	
<i>Towards An Ontologically-Supported Collaborative SGX .....</i>	205
GERT JAN HOFSTEDE, VINCENT PETERS, LÉON DE CALUWÉ, DENNIS MARTENS	
<i>WHY DO GAMES WORK? In search of the active substance .....</i>	211
ULRICH NORBISRATH, IVAR MÄNNAMAA, ANNE VILLEMS, KÜLLI KALAMEES-PANI	
<i>Mullivelled – Wrapping Computer Games into Educational Gaming Environments .....</i>	219

ELISABET M NILSSON	
<i>Simulated real worlds: science students creating sustainable cities in the urban simulation computer game SimCity 4</i> .....	227
CĂTĂLINA CIUCE, ELYSSEBETH LEIGH, HIDEHIKO KANEGAE	
<i>The development of a frame-game designed for organizational change management processes</i> .....	233
IRENA STANISLAVA BAJORUNIENE, VIKTORIJA BARSAUSKIENE, IRENA PATASIENE, AGNE KAZAKEVICIUTE	
<i>The Implementation of Business Game for Stimulating Socially Discriminated People Integration into Labour Market</i> .....	237
QINGQING DONG, ZHONGYI SUN, BRIAN MAC NAMEE	
<i>Physics-Based Table-Top Mixed Reality Games</i> .....	243
RAIMONDA MINKUTĖ, RIMA ŽITKIENĖ, DALIA KUNIGĖLIENĖ	
<i>The Analysis of the Importance of Students' Practice during Their Studies: Case of the Study Programme in Business Administration</i> .....	249
KLAUS-PETER SCHULZ, MICHAEL FOX	
<i>Creating Understanding and Meaning across Cultures: Playing a Business Game with Groups from the US, South Africa and Germany</i> .....	257
ARTHUR VAN BILSEN, GEERTJE BEKEBREDE, IGOR MAYER	
<i>Understanding complex infrastructure systems by playing games: Is it possible?</i> .....	265
SHINTARO HAYASHI, AKIRA TASUNE, AKIHIKO FUJINAWA , MASAMI IDO, YOSHIO HAYASHI	
<i>Libra 2: a Gaming Simulation for Learning Evacuation during Volcanic Eruption Crises</i> .....	271

## **The development of a frame-game designed for organizational change management processes**

**Cătălina Ciuce, Elysebeth Leigh, Hidehiko Kanegae**

### **Abstract**

This article describes the attempt to create a frame game that would help participants (organizational members) to understand the benefits of taking on a participatory approach in organizational change management processes. The simulation has three main phases. Throughout the steps employees and management have to work separately at first, and collaborate later on in order to obtain a shared vision of the change process. Being part of the planning and the implementation stages of change, employees get to reduce their resistance and have an overall better image of the process, which in turn provides a more efficient management of the situation. The article is going to present design related considerations, and the implications this gaming simulation might have for organizational members, researchers and consultants faced with a change process.

**Keywords:** organizational change; participatory approach; gaming simulations.

### **Introduction**

Organizational change is one of the most important challenges organizational researchers and consultants have to deal with. This is partly because of the great diversity within change processes from one organization to another, because of their length and the general lack of immediate results. Although changes vary widely, there still are a few general aspects of great importance that can be addressed in order to improve the whole management of the change situation. One of the key issues is the impact that such a process has on employees. Resistance to change is one of the first outcomes, while also being one of the main concerns consultants have to deal with.

#### The participatory approach on organizational change

‘It is true that an experience is by definition unique to each individual and that the sense of epiphany is mental’ (Corbeil, 2003, p. 166). Any important change process becomes a personal experience for an employee. This is one of the main reasons why people tend to react to change and why at first very few people embrace it, while most employees manifest resistance. Usually in real life companies’ change processes are designed and planned by management and organizational consultants and employees are at best involved in the implementation stage of the process. This is the “expert approach” to organizational change (Kasteren & Peters, n.d.). The participatory approach combines organization oriented change (focused on diagnosis, goal setting, design of the change process and implementation) with a person oriented change. The participatory approach allows organizational members to be part of the diagnosis stage in order to obtain problem awareness, in goal setting for creating a shared vision of the future and in the design of the change process to help them make the transition to the new organization more easily. Ultimately organizational members are involved in the implementation stage of the change process where the embedding of the new knowledge, skills and attitudes takes place.

Being involved in all these steps allows employees to have a better understanding of the change process, an increased awareness of it (Rafferty & Griffin, 2001), and to influence it so that their needs are better taken into consideration. All in all, involvement offers a sense of recognition, responsibility and achievement that are essential motivating factors (Hertzberg, 1968, in Cameron & Green, 2004) and driving forces in change commitment formation and overcoming resistance (Johnson & Fredian, 1986).

#### **The use of gaming simulation in change processes**

Kasteren and Peters (n.d.) present the role and usefulness of gaming simulations in the implementation of change when using an expert approach and in all other stages (except for

evaluation) if taking on a participatory approach of the organizational change process. Tsuchiya (1998) argues the impact of simulations in increasing the commensurability of interpretative frameworks which is essential to business reengineering because it provides the central direction indispensable to any change process. Through simulations organizational knowledge formation is enabled (Tsuchiya, 1998). Ruohomaki (2003) used a simulation game to analyze the present state of work processes in an organization and to test new operational models before implementing them. Yang, Leliaert, Zhao, Angehrn and van Geffen (n.d.) used a computer based simulation to help managers understand the main causes of resistance to change and identify the optimal tactics to reduce it.

In their overview of the studies on the use of simulation and gaming in organizational change processes Joldersma and Geurts (1998) identify two main categories of objectives: individual and collective learning. In individual oriented learning simulations have been used to explain actors' mental models, to change actors' mental models (Scherpereel, 2005) and to gain organizational members' support for change. Also at individual level simulation were successfully used in attitude change interventions (Bredemeier, Berstein & Oxman, 1982). In collective oriented learning interventions using simulations were focused on facilitating exchange of organizational members' perceptions, inducing awareness, facilitating interactions or training participants to deal with a new situation (Joldersma & Geurts, 1998).

### **Considerations for the design of the frame-game**

The purpose of this frame game is to offer organizations that experience a change process a helpful tool for monitoring it and overcoming resistance. Lack of information and a poor understanding of the change process produce fear and anxiety towards the change process which, in turn, may create passive or active forms of resistance. Simulations and gaming have been effectively used to construct a shared vision of the change process and help managers better communicate the change. The problem is that an organization, when changing, often goes through an iterative process where the initial plan is altered more than just once and where different courses of action have to be tested before implemented. In this case the initial shared vision may prove unhelpful later on in the process and may even hinder it. If organizational members have overcome their initial resistance, a series of unsuccessful changes during this testing phase could lower even more their newly formed commitment and resistance will generate new problems.

The intervention tool we present is therefore not aimed at creating a shared initial vision of change (even though such a vision might be broadly shaped during the gaming simulation) but at teaching organizational members the benefits of tackling change from a participatory approach and teaching them to use such an approach in all organizational processes. This helps organizational members to self monitor the change process through its entire cycle and is used to prevent further resistance formation.

Considering the participatory approach we felt that an open free form game would be a better option than a closed one in order to allow participants as much interaction as possible with the game model (Klabbers, 2006; Kasteren & Peters, n.d.) especially since the simulation is designed for exploratory and development purposes (Peters & Vissers, 2004).

The rationale for constructing the different rounds in the simulation was to increase the impact on participants by having them experience both the participatory approach and the nonparticipatory approach during the same simulation exercise, within a restricted time frame. Increasing the impact was also the reason why at a certain point in the simulation organizational members have to create a visual physical map of the change process. Having the change plans in a palpable format helps them better understand the impact any decision taken at a certain level of the organization has on other system components and mainly on other organizational members.

The scenario of the simulation is very broadly defined and there is no given set of rules that limit participants' actions. Throughout the simulation they are free to create their own inner group rules and to establish their own 'modus operandi'. The only constraints we established were those regarding the phases of the game and their sequence.

In terms of actors and roles, organizational members maintain their real life role, whether they are managers or employees. This helps maintain a realistic feel of the situation and favors the transfer of the knowledge and skills they obtain during the simulation back into real life and their specific organizational context (Tomikura n.d. in Joldersma & Geurts, 1998).

### **The flow of the gaming simulation**

The gaming simulation broadly consists of three rounds throughout which employees and management of an organization have to work separately at first, and collaborate later on in order to obtain a shared vision of the change process. For the first two phases of the simulation the two types of actors (employees and managers) have the same tasks, but they do not interact, nor do they receive any input on the progress of the other group. Both management and employees are going to be divided into smaller groups in order to obtain more than just one interpretation of the change process.

For the first round the managers are instructed to create their vision of the organization and the changes they believe should be implemented. Similarly the task of the employee teams is to create their version of the changes needed for the organization considering their own perspective of the status-quo and envisioning the company they would like to work for. At the end of this round each group has to present a written report on their conclusions, strategies and plans for the future of the company.

In the second round the groups of managers exchange their reports and their task is to create an image of the organization according to the other groups' report. In doing so they can use organizational flowcharts or any other type or representation they consider fit in order to have a visual representation of the changes the other group envisioned. The employee groups go through the same process creating representations of the output they have from the first phase.

During the final round of the simulation employees and managers have to work together in a mixed group (or groups, depending on the total number of participants) and their task is to produce a shared vision of the change process for the company.

### Debriefing

Considering the aim of the simulation is to help the members of a company understand the benefits of a participatory approach there are going to be independent debriefing sessions after each of the rounds and a final debriefing at the end of the simulation. All three debriefing sessions have different purposes and learning objectives.

The first debriefing session takes place separately with every group so that the output they each provide is not shared with the others at this point in the simulation. During this first session individual differences and the impact they have on the formation of a shared vision are discussed.

The second debriefing session is a plenary one. The visual maps for change created by all groups are discussed and compared. The participants are encouraged to share their experience in the first two rounds. For the first part, the debriefing will focus on how they felt when having to create a visual map starting from another groups' vision of the future, if it was an easy process or not, and what were the main problems they were faced with. The differences and similarities between group outcomes and the maps of the change process they created will be discussed. Overlapping different maps of the change process helps better identify similarities but also uncovers the main differences that may appear. Also, overlapping maps will help identify another key issue: what are the differences between the managers' vision and that of the employees. For the second part of the debriefing the focus will be on reaffirming the effects of a one sided perspective of the change process and the impact that the managers' vision has on the employees, since in real life it is usually the management of a company that shapes the change process. At the end of this session participants should understand that even within the managements' or the employees' group there are different perspectives generated by the different information they possess and that the decisions taken at higher organizational level may have undesired outcomes for middle and front level employees.



The final debriefing session (also a plenary one) concentrates on discussing the differences between single and multiple perspectives, and on comparing the participatory approach with the one sided approach where management decides regardless of the vision employees have. The benefits of a participatory approach are discussed but also the difficulties it raises. The conclusions obtained during prior debriefing sessions are revisited. The overall evolution of the simulation is analyzed and the focus is on identifying means to implement a participatory approach and ways to prevent problems from appearing during its implementation. In this final debriefing session input on the overall improvement of the frame game should also be gathered.

### Conclusions and further considerations

The learning objective of this simulation is to help organizational members understand the benefits of using a participatory approach when planning change but also to teach them how to use such an approach and what it implies. Our main concern while designing the simulation was to create a frame flexible enough to be easily adapted to different organizations and different change processes, but also to facilitate the transfer of what they learn during the gaming simulation back into their real life and organizational context. Although this type of simulation could prove to be useful, further testing of the frame game we designed is still needed in order to better understand its impact on organizational members faced with a major change process.

### Author information

Cătălina Ciuce, Babes-Bolyai University, Cluj Napoca, Romania.

Elysebeth Leigh, University of Technology, Sydney, Australia.

Hidehiko Kanegae, Ritsumeikan University, Kyoto, Japan.

### References

- Bredemeier, M. E. , Bernstein, G. & Oxman, W. (1982). Ba Fa Ba Fa and dogmatism/ethnocentrism. A study of attitude change through simulation-gaming. *Simulation & Games*, 13 (4), 413-436
- Cameron, E. & Green, M. (2004). *Making sense of change management*. Kogan Page Limited
- Corbeil, P. (2003). In the hive: a game on internal communications inspired by nature. *Simulation & Gaming*, 34 (1), 164 – 166.
- Johnson, H.H. & Fredian, A.J. (1986). Simple rules for complex change. *Training and Development Journal*, August, 47-49
- Joldersma, C. & Geurts, J.L.A. (1998). Simulation/ gaming for policy development and organizational change. *Simulation & Gaming*, 29 (4), 391- 399.
- Kasteren, B. J. & Peters, V. A. M. (n.d). *Gaming as an intervention tool in organization change processes*. Retrieved July 12, 2006 from [www.isaga-summerschool.org/2006/materialsforparticipants.html](http://www.isaga-summerschool.org/2006/materialsforparticipants.html).
- Klabbers, J.H.G. (2006), *The magic circle: Principles of gaming & simulation*, Sense Publishers, Rotterdam.
- Peters, V.A.M. & Vissers, G.A.N. (2004). A simple classification model for debriefing simulation games. *Simulation & Gaming*, 35 (1), 70-84.
- Rafferty, A. E. & Griffin, M.A. (2001). Expanding organizational diagnosis by assessing the intensity of change activities. *Organizational Development Journal*, 19 (3), 3-13
- Ruohomaki, V. (2003). Simulation gaming for organizational development. *Simulation & Gaming*, 34 (4), 531 – 549.
- Scherpereel, C. M. (2005). “Changing Mental Models: Business Simulation Exercises.”, *Simulation & Gaming*, 36 (5), pp. 388 – 403.
- Tsuchiya, S. (1998). Simulation/gaming as an essential enabler of organizational change. *Simulation & Gaming*, 29 (4), 400-408.
- Yang, H., Leliaert, P., Zhao, S., Angehrn, A. A. & van Geffen, L. (n.d.). *Understanding organizational dynamics of change in China: A multimedia simulation approach*. Retrieved April 30, 2008 from [http://www.calt.insead.edu/Eis/LingHe/material/ChalcPaper2\\_v8.pdf](http://www.calt.insead.edu/Eis/LingHe/material/ChalcPaper2_v8.pdf)